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Evolution of the Indian Space Programme

Words: 484, Characters: 3418 **LEVEL: HARD**

The remarkable journey of the Indian space programme is a globally recognized testament to scientific brilliance, resourcefulness, and a relentless pursuit of technological self-reliance. Established on August 15, 1969, the Indian Space Research Organisation (ISRO) began its operations with incredibly limited financial resources and basic infrastructural facilities. In its early days, rocket parts were famously transported on bicycles and bullock carts to the launching station in Thumba, Kerala. However, guided by the visionary leadership of Dr. Vikram Sarabhai, who firmly believed that space technology must be utilized for the practical socio-economic benefit of the common man, the agency rapidly evolved into one of the top six space organizations in the entire world. The successful launch of India's first experimental satellite, named Aryabhata, on April 19, 1975, using a Soviet launch vehicle, marked the nation's official entry into the exclusive global space club. Over the subsequent decades, ISRO achieved total self-reliance in launch vehicle technology with the development of the highly dependable Polar Satellite Launch Vehicle (PSLV) and the heavier Geosynchronous Satellite Launch Vehicle (GSLV). The true capability of Indian scientists was showcased to the global community during the historic Mars Orbiter Mission, affectionately known as Mangalyaan, which was successfully launched in November 2013. In a spectacular achievement, India became the first country in the world to successfully place a spacecraft in the Martian orbit in its very first attempt, and that too at a fraction of the cost incurred by Western space agencies. More recently, the nation celebrated another monumental milestone when the Chandrayaan-3 spacecraft successfully executed a soft and precise landing near the unexplored south pole of the Moon on August 23, 2023. This extraordinary achievement provided invaluable scientific data regarding the presence of frozen water and rare minerals on the lunar surface. While ISRO's historical focus has primarily been on remote sensing, weather forecasting, and satellite-based telecommunications, the government has recently initiated massive structural reforms to open up the highly lucrative space sector to private corporate participation. The establishment of the Indian National Space Promotion and Authorization Centre (IN-SPACe) in the year 2020 was a major policy shift designed to act as a single-window, independent nodal agency to facilitate and regulate the space activities of private startups. Today, young and dynamic Indian aerospace companies are independently designing small satellite launch vehicles, setting up private launchpads, and developing advanced high-resolution earth observation satellites.

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This strategic privatization is absolutely essential for capturing a larger share of the multi-billion-dollar global space economy. Looking forward to the future, the ambitious Gaganyaan mission aims to demonstrate human spaceflight capability by launching Indian astronauts into Low Earth Orbit (LEO) and bringing them back safely. As humanity prepares for a new era of deep space exploration and interplanetary colonization, India's robust, cost-effective, and highly innovative space programme stands as a shining example of excellence, ready to collaborate with international partners to unravel the profound mysteries of the vast universe.

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